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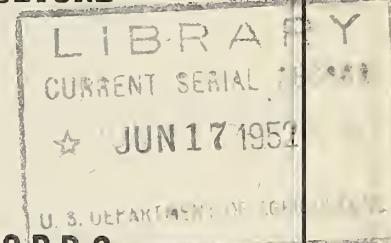
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WASHINGTON, D.C.



3  
PRODUCTION AND SALES RECORDS  
FOR  
MILK DISTRIBUTING COOPERATIVES

7a  
By  
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COOPERATIVE RESEARCH AND SERVICE DIVISION.

UNITED STATES DEPARTMENT OF AGRICULTURE  
FARM CREDIT ADMINISTRATION  
WASHINGTON 25, D. C.  
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U. S. DEPARTMENT OF AGRICULTURE

WASHINGTON 25, D. C.

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## SUMMARY

This report presents an integrated series of product and sales records designed to help milk distributing cooperatives meet their record keeping problems. They reflect the experience of many associations and present practical solutions to many record-keeping problems.

Loss of product, especially butterfat, can be just as effective in reducing the returns to producer patrons of cooperatives as loss of cash or failure to collect accounts outstanding. Product losses incurred at the receiving platform, in the actual processing operation, after processing, at the cooler, and on routes may be due to any one or all of the following: Inaccurate test of milk received, leaks, spillage, incomplete separating, inaccurate standardizing of products, excessive evaporation in pasteurizing, spoilage, and dishonest personnel.

Two of the most important reasons why product records are not maintained on a daily basis are that to maintain these records it is necessary to determine the butterfat content of the milk received daily, and because many plants lack facilities to determine the quantity of milk held over each day.

Milk in many plants goes directly into processing as it is received and it is not possible to sample and test the milk before it is processed except on an individual producer basis. The cost of testing milk delivered by each producer daily may exceed the advantage of a daily butterfat balance. In most plants, it is possible to obtain a reasonably accurate composite sample of all milk received by using what is commonly referred to as a "drip sample."

If a drip sample cannot be obtained, a butterfat balance for the same period as the normal testing period for milk delivered by individual producers can be used. If the milk delivered by producers is sampled daily and the composite samples are tested every 10 days, the butterfat balance period would be 10 days. This procedure is not entirely satisfactory because it is extremely difficult to trace losses when the time of the loss is not known. However, it is much better than no check on losses.

In some plants, all milk is processed the day it is received. In many others, milk is held over in tanks which are not equipped with gages and it is impossible to determine accurately the quantity of milk held at the end of each day. The cost of installing such gages is not excessive and, in many cases, the savings would far exceed the expense.

In many plants, wastes and losses are high simply because no attempt is made to determine the extent of wastes and losses or to encourage waste consciousness. Merely installing proper records can reduce losses by encouraging the plant personnel to be waste conscious.

The fact that honest and competent employees may be effective in reducing plant losses of butterfat cannot be disputed. However, many losses cannot be traced to incompetency or dishonesty on the part of personnel but to mechanical deficiency in the plant.

To aid in locating the cause or source of product losses, a product accounting system should be set up so that the extent of loss can be determined by departments. The cause of the loss can then be isolated and corrective measures adopted. The product accounting system presented in this report has been designed to determine the butterfat losses for each of five functional departments -- receiving, pasteurizing and bottling, separating, byproducts, and storage. One report form, designed to cover the combined operations of the receiving, pasteurizing and bottling, and separating departments, is included for plants in which major alterations in operations would be required to separate these operations into functional departments for record keeping purposes.

Product losses are not necessarily confined to the processing operations. Losses also can be experienced in storage and on routes. Consequently care must be taken to keep such losses at a minimum.

The need for sound route and sales accounting procedures is almost universally recognized by experienced managers. To make it possible to maintain proper control over accounts receivable and to plan sales programs, sales and route records must be kept current and in a form which makes it possible to make comparisons and to watch the trends of the individual routes. Thorough checking of the settlement report when the salesman checks in, is extremely important. Errors are much more easily located and corrected if they are discovered soon after they are made.

Excessive losses in accounts receivable may materially reduce the returns which the producer-patrons of a fluid milk distributing association receive for their milk. Generally the route salesmen are held responsible for collections. The usual policy is to set a maximum time limit on each retail and wholesale account and hold the salesmen completely responsible for paying any deliveries made in excess of this limit.

The multiple copy writing board system for handling the producer pay roll has been adopted by some associations. The advantages of this system are that it reduces the time required to complete the pay roll and eliminates errors which are often made in transferring figures from one form to another.

However, to be certain that all errors are eliminated from the producer pay roll before statements and checks are sent out, a proof of the pay roll should be made. This can be done by calculating the total amount of money all producers should receive for the total milk delivered and comparing this amount with the pay roll total taking into account deductions such as retains, supplies, etc.

## PRODUCTION AND SALES RECORDS FOR MILK DISTRIBUTING COOPERATIVES

By

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Records are a prerequisite to maintaining proper controls over operations in a milk bottling plant. Unfortunately, in many association records are inadequate for this purpose. Some associations have not operated long enough to encounter extremely unfavorable conditions and consequently have not become aware of the importance of adequate records. However, not only are younger associations without proper records but some of the older associations as well.

There are three separate phases of accounting in a milk plant--general accounting, cost accounting, and product accounting. General accounting sets forth the total dollars of saving or loss of the business as a whole. Cost accounting discloses the saving or loss on each unit or operation involved. And product accounting sets forth the balance between the quantity of milk received and the quantity of processed product sold.

The main purpose of this report is to analyze some of the problems involved in product accounting and to present some methods which can be used effectively in recording and maintaining control over the use of the product. In addition, some methods of handling selected portions of the general accounting procedure are presented.

As a basis for this study, a background of the record keeping problems confronting cooperative milk distributing associations was obtained by visiting twelve associations. These associations are located in Alabama, Georgia, Louisiana, Michigan, North Carolina, Ohio, and Pennsylvania. The quantity of milk handled annually ranges from approximately five million pounds in the smallest association to 120 million pounds in the largest.

Results of the study were first issued for limited distribution in a special report. Copies of this report were circulated to a selected group of managers of cooperatives, college research workers and teachers, and others with experience in handling dairy records. Suggestions from those persons were incorporated into this report. A portion of the system of records, as presented in the earlier report, later was partially tested under actual operating conditions.

NOTE: Appreciation is due Donald E. Hirsch and Irwin R. Hedges for their guidance and assistance in preparing this report.

## PRESENT RECORD-KEEPING PRACTICES OF COOPERATIVES

In general the associations visited have given much more attention to the general financial phase of dairy accounting than they have to the cost and product phases.

This situation is to be expected for several reasons. An audit of the financial records is almost a universal requirement of cooperative charters or bylaws. This is normally interpreted to mean an audit of the general financial records. Relatively few cooperatives are financed entirely by member capital, and most lenders require regular reports which are based primarily on the general financial records. As long as the business as a whole is gaining, there is a tendency to attach little importance to the gains and losses of individual departments.

Although most associations recognize that keeping product losses to a minimum is important, only five of the associations visited were making a systematic attempt to determine the extent of wastes and losses of products. Three of these associations kept sufficient records to determine the extent of butterfat losses, but the other two concerned themselves only with total milk losses. This latter procedure is questionable as excessive losses of butterfat may be incurred without excessive losses in total product. One of the greatest sources of such losses is underreading tests on products sold.

The daily butterfat balance, maintained by one association, indicated that, although the program of sampling and testing producer milk for butterfat was very thorough, some loss of butterfat was experienced due to overreading the tests of producer milk. Such losses would not have been discovered without adequate processing records. Although such losses would not necessarily reduce returns received by all producers for milk, inequity in returns to individual producers could result.

The majority of the associations visited were keeping adequate records of the products after they were placed in the cooler. All but two were taking an inventory of the cooler at least once each day. All but one required a credit memorandum before any item could be taken from the cooler.

Exercising control over unit sales on routes is important. This control is important not only in keeping product losses at a minimum but is necessary in order to control route financial records.

Most associations have, at least partially, solved the problem of keeping the total balance outstanding, as carried in the route book, in agreement with the balance on the route salesman's daily settlement report. They check the daily settlement sheets thoroughly when the route salesmen check in, they check the route books as often as deemed necessary on the basis of experience with the individual salesman, and they hold the salesmen responsible for any discrepancies.

Two of the associations visited had installed bookkeeping machines and were posting the individual retail accounts daily. This daily posting is an expensive operation and, unfortunately, will not necessarily completely solve the problem.

Two of the 12 associations visited had just recently begun retail delivery of milk and had not established definite credit policies on this portion of their accounts. Six of the remaining 10 associations send monthly statements to their retail customers and find that these statements are rather effective in aiding collections. Only one of the associations reported that office payments exceeded route collections.

Although most associations have given considerable attention to the general financial phase of dairy accounting, the breakdown of expense records for the purpose of comparison and analysis are still problems. Methods of keeping such records are not included in this report, but a study of these problems would be extremely useful.

#### SUGGESTED PRODUCTION RECORDS

A product accounting system is designed to provide information which the manager and his plant supervisor can use to reduce butterfat losses. In addition, the information thus provided should enable the association to have a basis for cost analysis, account to producers for the value of milk, know how milk is being utilized, and produce products of uniform composition. The final figures should give a complete picture of how much milk is received and processed every day, the extent of product losses, and the operations that are responsible for the losses.

To be useful, this information must be kept current. It is much more difficult to determine the reason for any particular loss as the time between experiencing and discovering the loss increases. In addition, if records are kept current, many losses can be checked before they become excessive. To aid in locating the cause or source of product loss, a product accounting system should be set up so that the extent of loss can be determined on a departmental basis. The cause of the loss can then be isolated and corrective measures adopted.

The processing operations of practically all milk distributing plants can be divided into five functional departments--receiving, pasteurizing and bottling, separating, byproducts and storage. The product accounting system, presented on the following pages, was designed to determine the butterfat losses for each of these departments. These departmental losses can then be summarized to determine the total plant loss (form 17, page 29).

It is practically impossible to design forms for a product accounting system which are adaptable to all fluid milk plants. The forms illustrated are presented purely as suggestions. Undoubtedly, some changes would be necessary to fit the forms into an individual plant operation. However, changes should be avoided which will eliminate information

which the system has been designed to provide, as they could reduce its effectiveness. Short cuts can sometimes be expensive.

Forms used to record processing data in the plant should be as simple as possible. In order to maintain a product accounting system and keep losses at a minimum, the management must have the full cooperation of all employees. Requiring plant employees to keep and submit complicated forms and reports not only requires too much of their time, but also tends to eliminate any interest they might have in a product accounting system.

It is well to remember, that plant men, are not accountants. They should be required to do no more than keep the actual plant records. All summarization and calculating should be done in the office.

Forms used to record data in the plant should be designed so that plant men can record in the units with which they are working, whether it is pounds, gallons, quarts or some other measure. Estimates and conversions should be held to an absolute minimum. If it is necessary for plant men to estimate to the nearest gallon the quantity of product used, or to make conversions -- that is gallons to pounds, or pounds to quarts -- errors are sure to be made and the accounting records become much less valuable.

#### RECEIVING ROOM RECORDS

Two major receiving room obstacles discourage many smaller plants from setting up product accounting systems. They are the need for determining the butterfat test of the milk received from producers each day, and the necessity of having equipment to determine the quantity of milk held over each day.

Daily testing of milk received from each producer is impractical for most plants. In some plants milk flows directly from the receiving vat to storage tanks where it is held for further processing. In these plants the butterfat test of the milk received from producers can be determined by sampling and testing the milk in the storage tank. This can be done, of course, only when no milk other than that received from producers is held in the tank.

In lieu of the above two procedures, an accurate plant composite of milk received can be made through the use of what is commonly referred to as a "drip sample." To obtain a representative sample in this manner it should be obtained from a high point in the line, where the flow of milk is uniform and where there is no possibility of line drainage when flow in the pipeline ceases. The sampler should be so placed as to avoid whirlpools which would result in intermittent flow from the sampling device. It is not advisable to locate the sampling device ahead of a check valve since the sudden closing of the valve has a tendency for any milk in the sampler, or its discharge tube, to be drawn back into the

line.<sup>1</sup> Associations considering the installation of this type of sampling device might well seek the advice of the dairy department of their State College of Agriculture.

The accuracy of a drip sample can be determined by comparing the quantity of butterfat received during the test period, as measured by the drip sample, with the quantity received as measured by the tests of the samples taken from individual producer's deliveries. Such a comparison should be made at the end of each testing period. If a difference exists, immediate steps should be taken to determine the cause. The difference may not be due to a faulty drip sample, but may be due to faulty sampling or testing of the milk as it is received from the individual producers.

If a difference is found to exist when this comparison is made the difference should be added to or subtracted from the total butterfat gain or loss of the plant (see form 17, page 29).

If milk is held over in tanks which are not equipped with gages, it is impossible to determine accurately the quantity of milk held at the end of each day. The cost of installing gages is not extremely high and, in most cases, the savings experienced by better product control measures would far exceed the cost of installation.

Producer deliveries - The forms used to record the weight of milk delivered by producers is normally dependent upon one of two factors, or a combination of the two -- legal requirements and plant or producer preference.

Forms 1, 2, and 3 are examples of forms in general use. At least two copies of form 1 or 2 should be made; one to be sent to the producer and the other to the office for summarization. Form 3 can be used for summarization purposes by transferring the weights from the office copies of either form 1 or 2.

Many plants record the weights of individual producer's milk directly onto form 3, thus eliminating form 1 or 2. This can be done where plants are not required to notify producers daily of the weight of milk received. The form is designed so that one sheet can be used for the first half of the month and another for the second half. If this procedure is followed, a listing of the daily weights can be sent to the producer along with each settlement statement or check. This listing can be an adding machine tape or the weights can be transferred to a settlement statement (form 29).

Receiving Room Report - The receiving room report (form 4) provides a complete daily summary of receiving room operations.

Transferring operating data from one form to another should be held to a minimum. Thus the receiving room report has been designed so that plant men can record all receipts directly on the report, except receipts

<sup>1</sup>Thomsen, L. C., "Wastes and Losses in Dairy Plant Operations," MILK PLANT MONTHLY, Vol. XXXVIII No. 7, July, 1949, pp. 26-28.



DATE \_\_\_\_\_

FORM 4  
RECEIVING ROOM REPORT

## RECEIPTS

FROM:	MILK						CREAM						SKIM					
	GALLONS	QUARTS	POUNDS	TEST	FAT	GALLONS	QUARTS	POUNDS	TEST	FAT	GALLONS	QUARTS	POUNDS	TEST	FAT	GALLONS	QUARTS	POUNDS
Hold-over (a.m.) (1)																		
Producers (2)																		
Other purchases (3)																		
All returns (4)																		
Total (5)																		
Less hold-over (p.m.) (6)																		
Total (7)																		
From storage (8)																		
From separation (9)																		
Total (10)																		

## DISPOSITION

TO:	MILK						SUMMARY						Remarks:					
	GALLONS	QUARTS	POUNDS	TEST	FAT		POUNDS	TEST	FAT		POUNDS	TEST	FAT		Pounds	Test	Fat	
Pasteurizing (11)														Receipts:				
Pasteurizing (12)														Milk	(from line 7)			
Pasteurizing (13)														Cream	(from line 7)			
Total (14)														Skim	(from line 7)			
Separation (15)														Total				
Separation (16)														Fr. Stor. &				
Separation (17)														separation:				
Total (18)														Milk	(from line 10)			
By-products (19)														Cream	(from line 10)			
By-products (20)														Skim	(from line 10)			
Total (21)														Total				
Returns discarded (22)														Grand total				
Grand total (23)														Dispositions	(from line 24)			
Grand total (24)														Gain				
														Loss				

from producers, and all disposition of milk to other departments in the plant. For this reason, the report must be accessible when the receiving room is in operation.

The quantity and the test of milk, cream, or skim received from either outside the plant or from other departments within the plant is recorded in the appropriate column on lines 1 through 10. The quantity and test of the milk transferred from the receiving room to other departments within the plant is recorded on lines 11 through 22. Several lines have been provided for each department thus permitting the recording of each transfer. The total milk transferred to each department should be recorded on lines 14, 18, and 22, and the grand total of all milk transferred from the receiving room should be recorded on line 24.

Plant personnel should record all receipts and transfers in the units with which they are working -- gallons, quarts. They should not be required to compute the conversion to pounds. Also, plant personnel should not be required to complete the column headed "fat." The conversion to pounds and the computation of the fat content of the milk and cream or both can be more easily and accurately accomplished in the office with the aid of conversion tables and a calculator.

All goods returned should be charged to the receiving room regardless of whether they can or can not be used. The fat content of returns should be determined by an actual test. The quantity and test of the returns should then be recorded on line 4. The quantity and test of the returns that are determined "not usable" should be recorded on line 23.

The total milk, cream, and skim received from sources outside the plant (lines 2, 3 and 4) plus that held over from the previous day (line 1) is shown on line 5. This total, less the hold-over at the end of the day (line 6), is shown on line 7. The total milk, cream, and skim received from other departments within the plant (lines 8 and 9) is shown on line 10.

The difference between total receipts (line 7 plus line 10) and the total transfers to other departments in the plant (line 24) is the gain or loss experienced in the receiving department. A portion of the report "Summary" has been set aside to facilitate the computation of the gain or loss experienced.

#### PROCESSING RECORDS

Standardizing - Milk may be standardized in one of several departments, depending on the plant lay-out and the type of equipment used for pasteurizing. Plants using vat type pasteurizers usually standardize in the pasteurizing vats. Many plants using short-time pasteurizers standardize milk in storage tanks located in the receiving department. Cream is standardized either in the separating or pasteurizing and bottling department.

The standardizing report (form 5) can be used regardless of the department in which the standardizing is actually done. Any gain or loss is computed on the report of the department in which the standardizing is done. Form 5 is a record of the products used in standardizing and the resultant products.

The report illustrated provides space for recording the standardization of four separate batches. This, of course, can be altered to fit the needs of the individual plant.

If milk is being standardized, the amount and test of the milk to be standardized should be recorded on line 1. The amount and test of the milk, cream, or skim used in standardizing should be recorded on lines 2, 3 and 4, or 5 and 6 respectively. The amount and test of the derived product should be recorded on line 7. This recorded test should not be a computed test but should be based on an actual analysis.

Many plant managers tend to minimize the importance of standardizing. Plant men often say they know how much cream or skim to add to the milk received from producers without actually testing the milk. The daily variations in the butterfat test of the milk received from producers is much too great to rely on estimates. Persons realizing that a 0.1 percent error in the test of 4 percent producer milk will result in a 2.5 percent plant gain or loss, will certainly test the milk carefully and not depend on estimates. Careless standardizing may result not only in excessive loss of butterfat, but also in inconsistent final products.

Pasteurizing and Bottling - All milk, cream, and skim received in the bottling department, whether for bottling as such or for standardizing, should be recorded on lines 1 through 14 of form 6. Space has been provided so that all receipts can be recorded in the units with which the men are working, and by departments. As an example, all milk received from the receiving room should be recorded on lines 1, 2, or 3 in the applicable unit column of the section headed "receiving." In the case of cream taken from storage, the amount should be recorded on lines 6 to 8 in the applicable unit columns of the section headed "storage."

The quantities of milk, cream, and skim bottled should be recorded under the applicable unit columns on lines 15 through 37. The record of the quantity bottled can be in cases or actual number of bottles, depending on the counting method used. If the record is kept by case the plant men should be cautioned as to the importance of recording portions of cases as well as full cases. Space is provided - "bottles broken" - to record the quantity of milk lost due to breakage of partially or completely filled bottles.

When milk and cream are standardized just prior to pasteurization and bottling, the test of the product following standardization can be used as the test of the product bottled. However, to assure accuracy and uniformity, it is well to test the product as it is being bottled, by

FORM 5  
STANDARDIZING REPORT

STANDARDIZING REPORT						
DATE	PRODUCT	GALLONS	QUARTS	POUNDS	TEST	FAT
	Milk (1)					
	Milk (2)					
	Cream (3)					
	Cream (4)					
	Skim (5)					
	Skim (6)					
	Derived Product (7)					
	PRODUCT	GALLONS	QUARTS	POUNDS	TEST	FAT
	Milk (1)					
	Milk (2)					
	Cream (3)					
	Cream (4)					
	Skim (5)					
	Skim (6)					
	Derived Product (7)					

**FORM 6**  
**PASTEURIZING AND BOTTLING REPORT**

Date \_\_\_\_\_

PRODUCT	RECEIVING					SEPARATING					STORAGE				
	GALLONS	QUARTS	POUNDS	TEST	FAT	GALLONS	QUARTS	POUNDS	TEST	FAT	GALLONS	QUARTS	POUNDS	TEST	FAT
Milk (1)															
Milk (2)															
Milk (3)															
Milk - Special (4)															
Milk - Special (5)															
Cream (6)															
Cream (7)															
Cream (8)															
Cream (9)															
Skim (10)															
Skim (11)															
(12)															
(13)															
Total (14)															
BOTTLING										SUMMARY					
PRODUCT	GALLONS	QUARTS	PINTS	½ PINTS	QUARTS EQUIVALENT	POUNDS	TEST	FAT	RECEIPTS		POUNDS	FAT	REMARKS:-		
Regular (15)									Receiving		(From Line 14)				
(16)									Separation		(From Line 14)				
(17)									Storage		(From Line 14)				
(18)									Total						
Total (19)									Production:						
Special (20)									Bottled		(From Line 38)				
(21)									Gain						
(22)									Loss						
Total (23)															
Homogenized (24)															
(25)															
(26)															
(27)															
Total (28)															
Skim (29)															
(30)															
Total (31)															
Cream (32)															
(33)															
Total (34)															
Cream (35)															
(36)															
Total (37)															
Grand Total (38)															
Bottles Broken															

removing containers from the line at intervals based on the quantity of milk handled.

The column headed "quarts equivalent," "pounds," and "fat" should be completed in the office. The column headed "quarts equivalent" was provided to simplify the conversion of the various units to pounds.

The gain or loss in the pasteurizing and bottling department is determined by calculating the difference between receipts from all departments as shown on line 14 and total production as shown on line 38.

Separating - The separating department report (form 7) is rather similar to the reports previously discussed. All receipts of milk should be recorded in the proper spaces (depending on source and units) of the upper portion of the report. The disposition of the dervied cream and skim should be recorded in the lower portion of the report.

Tests to determine butterfat content should be made of not only the cream but also the skim milk. The greatest potential source of loss in the separating department is a faulty separator. The fact that a separator is set to produce 40 percent cream does not mean that the cream necessarily will test 40 percent. In all cases, every batch of cream should be tested. In the case of cream that is placed in storage, the container should be marked both as to quantity of cream and actual test.

An error, frequently made in milk plant accounting, is to assume that skim milk has no butterfat or that the butterfat content is insignificant. Testing skim milk will make it possible not only to keep accurate records but will also serve to make those concerned more aware of the fact that skim milk does contain a significant quantity of fat and is a potential source of fat loss.

Receiving, Pasteurizing and Bottling and Separating Combined - In some plants it may be impossible, without major alterations in the plant operations, to separate the receiving, pasteurizing and bottling, and separating operations into departments for record keeping purposes because of the arrangement and type of equipment used.

In such cases, a form such as form 8 can be used. All receipts -- producer deliveries, outside purchases, returns, products taken from storage or other departments -- are recorded on the upper portion of the form on lines 1 through 10. Bottled production is recorded on lines 11 through 34 in the proper unit columns, and a record of the milk, cream or skim transferred to other departments is made on lines 36 through 48. All returns should be charged in as receipts and the amount of the returns determined to be unusable should be recorded on line 46. A portion of the report (summary) has been set aside to facilitate the computation of the gain or loss experienced.

The use of form 8 is not a preferred method of keeping production control records since its use does not facilitate the isolation of

**FORM 7**

DATE \_\_\_\_\_

## SEPARATING DEPARTMENT

RECEIPTS						SUMMARY		
SOURCE:	GALLONS	QUARTS	POUNDS	TEST	FAT	ITEM:	POUNDS	FAT
Receiving (1)						Receipts (from line 13)		
Receiving (2)						Disposition (from line 27)		
Receiving (3)						Gain		
Total (4)						Loss		
Pasteurizing & bottling (5)						Remarks:		
Pasteurizing & bottling (6)								
Pasteurizing & bottling (7)								
Total (8)								
Storage (9)								
Storage (10)								
Total (11)								
(12)								
Grand Total (13)								

## DISPOSITION

**FORM 8**

Date

**OTHER DISPOSITION**

causes of loss as well as the previously discussed departmental reports. However, use of this form does make it possible to determine the extent of losses, if any, on the overall receiving, bottling and separating operations and if excessive losses are experienced, changes should be made in the plant operations to make more detailed departmental records possible.

Byproducts -- Chocolate and Buttermilk - The chocolate milk (or drink) and buttermilk processing and packaging records, forms 9 and 10 respectively, are sufficiently similar to warrant being discussed jointly.

The ingredients used should be recorded in the upper portion of the forms. The departments from which the ingredients were received should be noted in the column headed "source." Both of these forms have been designed to make it possible to keep the record of the dairy products used as ingredients separate from the non-dairy products. However, to determine the gain or loss, the difference between the total of both dairy and non-dairy products used (line 12) and total derived product (line 16) must be computed.

The bottling record has been included on both of these forms rather than on form 6, page 11. This was done because of the difficulty many plants would have in determining the total quantity of derived product prior to bottling.

Plants that have proper equipment to determine the quantity of derived product prior to bottling can, if they prefer, change these forms so that all bottling could be recorded on form 6. If this is done, space should be provided on both forms 9 and 10 to record the total derived product.

Cottage Cheese - A complete and accurate cottage cheese processing record should be kept, not only to determine losses which may be experienced but also to aid in producing a uniform quality product. Form 11 provides space to record the quantity of products used (lines 1-14) and also the quantity of cheese made (lines 15-22). Only dry curd and creamed cottage cheese taken from storage for further processing or packaging should be recorded on lines 12 and 13. Space also has been provided to make it possible to record other processing information (lines 23-26).

A specific section has not been set aside to compute the gain or loss in the production of cottage cheese. The yield of cottage cheese will vary from 13 to 19 pounds for each 100 pounds of skim milk, depending upon the amount of moisture left in the cheese and the solids content of the skim milk. The solids content of skim milk will vary from 8.3 to 9.5 percent of the total weight of the liquid milk. The higher the solids content of the milk, the greater the yield of cheese. If non-fat dry milk solids are used, the yield, of course, will depend on the proportion of solids used. One hundred pounds of 11 percent solids skim milk will yield 17 to 18 pounds of curd. If the yield is significantly greater or

**FORM 9**  
**CHOCOLATE MILK PROCESSING AND PACKAGING RECORD**

DATE \_\_\_\_\_

INGREDIENTS		GALLONS	QUARTS	POUNDS	TEST	FAT	SOURCE		
Whole milk	(1)								
Skim	(2)								
Dried milk	(3)								
Total dairy	(4)								
Sugar	(5)								
Cocoa powder	(6)								
Syrup	(7)								
Stabilizer	(8)								
Water	(9)								
	(10)								
Total nondairy	(11)								
Total	(12)								
GALLONS	QUARTS	PINTS	½ PINTS			QUARTS EQUIVALENT	POUNDS	TEST	FAT
(13)									
(14)									
(15)									
Total (16)									
Remarks:							Gain		
							Loss		

## BUTTERMILK PROCESSING AND PACKAGING RECORD

FORM 10

DATE \_\_\_\_\_

INGREDIENTS		GALLONS	QUARTS	POUNDS	TEST	FAT	SOURCE		
Whole milk	(1)								
Skim milk	(2)								
Dried milk	(3)								
Starter	(4)								
Churned cream	(5)								
Total dairy	(6)								
Water	(7)								
	(8)								
	(9)								
	(10)								
Total nondairy	(11)								
Total	(12)								
GALLONS	QUARTS	PINTS	½ PINTS			QUARTS EQUIVALENT	POUNDS	TEST	FAT
(13)									
(14)									
(15)									
Total (16)									
Remarks:							Gain		
							Loss		

**FORM II**  
**COTTAGE CHEESE PROCESSING AND PACKAGING RECORD**

DATE: \_\_\_\_\_

INGREDIENTS	GALLONS	QUARTS	POUNDS	TEST	FAT	SOURCE:
Skim (1)						
Dried milk (2)						
Starter (3)						
Whole milk (4)						
Cream (5)						
Cream (6)						
Total dairy (7)						
Rennet (8)						
Water (9)						
Flavoring (10)						
Total nondairy (11)						
Dry curd (12)						
Creamed curd (13)						
Total (14)						

ITEM	LBS. BULK	LBS.	12 OZ.	8 OZ.				DISPOSITION*
Dry curd (15)								
Dry curd (16)								
Dry curd (17)								
Total (18)								
Creamed (19)								
Creamed (20)								
Creamed (21)								
Total (22)								

PROCESSING INFORMATION		REMARKS:
Setting time (23)		
Cutting time (24)		
Cooking time (25)		
Number of cold washes (26)		

\*To bulk storage or to cold room in sales unit.

less than these "normal" yields, a proportionate gain or loss should be noted in the section headed "remarks." If the yield runs consistently at the lower level, steps should be taken to determine the cause.

The departmental source should be indicated for all products used in making the cheese.

In the column headed disposition, a note should be made as to whether the product was packaged ready for sale or placed in storage in bulk form for future packing into sales units.

Ice Cream - Of all products normally processed by fluid milk distributing cooperatives, ice cream is probably the most variable in composition. Consequently, extreme care is necessary in selecting ingredients and preparing the mix. Associations manufacturing only a relatively small quantity of mix normally do not have adequate testing facilities available to check ingredients, but must rely on using milk products of uniform composition.

The only difference between the mix record presented with this system (form 12) and mix record forms in general use is that space has been provided for calculating the gain or loss for each batch of mix. Space also has been provided to note the departmental source of ingredients used. Since this system is designed to determine loss of total volume and butterfat, the calculation of a gain or loss of solids-not-fat is not necessary. However, it is necessary to be sure that the solids-not-fat content of the mix meets legal standards.

This form is designed to make it possible to calculate the total dairy and non-dairy ingredients used separately (lines 13 and 18). However, to determine the gain or loss, the difference between the derived product (line 20) and the total ingredients (line 19) must be computed.

In calculating the total gain or loss of butterfat, the computed test should not be relied upon, but the actual butterfat test of the mix should be used. In the absence of facilities for making a more refined test, a modified Babcock test can be used to determine the butterfat content of the mix.

Disposition of the mix should be noted on lines 23 and 24. If the mix is placed in the cooler for aging, the quantity should be recorded on line 24. If the mix is aged for only a short time and goes to the freezer the same day that it is made, the quantity should be recorded on line 23.

If plant men are accustomed to recording the quantity of mix produced in gallons, and it is not convenient to weigh it, the following formulas may be used to determine the weight of the mix.<sup>2</sup>

<sup>2</sup>Leighton, Alan - "Commercial Ice Cream Formulas", Bureau of Dairy Industry, U.S.D.A., Washington, D.C., 1945.

**FORM 12**  
**ICE CREAM MIX REPORT**

INGREDIENTS	GALLONS	QUARTS	POUNDS	TEST	POUNDS FAT	PERCENT S.N.F.	POUNDS S.N.F.	PERCENT TOTAL SOLIDS	POUNDS TOTAL SOLIDS	SOURCE:
Cream	(1)									
Cream	(2)									
Cream	(3)									
Total	(4)									
Butter	(5)									
Whole Milk	(6)									
Skim	(7)									
Dried skim	(8)									
Condensed - Plain	(9)									
Condensed - Sweet	(10)									
	(11)									
	(12)									
Total Dairy Products	(13)									
Sugar	(14)									
Sugar	(15)									
Stabilizer	(16)									
Stabilizer	(17)									
Total Non Dairy	(18)									
Total Ingredients	(19)									
Derived Product	(20)									
Derived Product	(21)									
Gain or Loss	(22)									
Mix to Freezer	(23)									
Mix to Storage	(24)									

Remarks:

$$\text{Specific gravity of ice cream mix} = \frac{100}{\frac{\text{Percent Fat}}{0.93} + \frac{\text{Percent sugar, serum solids and stabilizer}}{1.58} + \text{Percent water}}$$

$$\text{Weight of a gallon of mix} = \text{Specific gravity} \times 8.345$$

Form 13 is the ice cream freezing record. No volume or fat loss is calculated. Any significant deviation from the desired overrun should be noted. In the column headed "source," note should be made as to whether the mix was taken from storage or was frozen the same day that it was made.

The following formulas may be used to calculate the overrun:<sup>2</sup>

$$\text{Percent overrun} = \frac{\text{Volume of ice cream} - \text{volume of mix}}{\text{Volume of mix}} \times 100$$

$$\text{Percent overrun} = \frac{\text{Weight of mix} - \text{weight of same volume of ice cream}}{\text{Weight of same volume of ice cream}} \times 100$$

#### STORAGE RECORDS

Bulk storage - The bulk storage inventory report (form 14) is designed primarily for fluid milk plants that normally carry a rather large inventory of products such as cream, whole milk powder, non-fat dry milk solids, and whole and skim condensed. Plants that carry a relatively small inventory of these can keep the record on form 15.

Form 14 can be used with a system requiring two inventories daily or a system requiring a single inventory each day. The decision as to which system should be used must be based on past experience with storage losses. If losses have been excessive, an inventory should be taken twice each day.

If two inventories are taken daily, it is suggested that one inventory be taken in the morning before operations begin, and the other inventory be taken at the end of the day. The morning inventory should be recorded on line 1 and the evening inventory on line 15. If only one inventory is taken, an evening inventory is recommended and this inventory should be recorded on line 15. The inventory data on line 1 would be the same as the inventory on line 15 of the previous day's report.

All products placed in storage by other departments should be recorded on lines 2 through 5, noting the department from which the products were received. All products taken from storage for further processing should be recorded on lines 9 through 12, noting the department to which the products are charged.

All products purchased and received during the day, other than those charged to the receiving department, should be recorded on lines 6 and 7.

**FORM 13**  
**ICE CREAM FREEZING REPORT**

**DATE** \_\_\_\_\_

SOURCE	GAL- LONS MIX	POUNDS MIX	TEST	FLAVORING ADDED			TOTAL MATERIAL USED	PACKAGES			TOTAL GAL- LONS MADE	PER- CENT OVER- RUN	
				FAT	•	FLAVOR		5 GALLON	2½ GALLON	QUARTS	INTS		
(1)													
(2)													
(3)													
(4)													
(5)													
(6)													
(7)													
(8)													
(9)													
Total	(10)												

**Remarks:**

**BULK STORAGE INVENTORY**

FORM 15  
DAILY COLD ROOM INVENTORY

For period beginning \_\_\_\_\_ and ending \_\_\_\_\_

The total of lines 1 through 7 is the total of each product to be accounted for. This total should be recorded on line 8. To arrive at the calculated inventory, subtract from this total (line 8) the amount of the product taken out of storage (lines 9 through 12) as recorded on line 13.

Any difference between the calculated and actual inventory is, of course, the gain or loss experienced in the bulk storage department.

For the purpose of computing a production balance for the day's operation, it is necessary to determine the net change in inventory for each product held in storage. The difference between the morning inventory (line 1) and the evening inventory (line 15) is the net change in inventory.

Plants that carry a relatively small inventory of bulk storage products can keep the inventory record on form 15, along with the inventory of finished products, rather than keeping a separate bulk storage record.

Since one inventory of bulk products each day should be sufficient, only the lower right portion of this report need be used.

The morning inventory, whether it is an actual inventory or taken from the previous evening inventory, should be recorded on line 16 in the proper product column. The amount of all products received from other departments during the day should be recorded on line 19 and 20. All purchases, not charged to the receiving room, should be recorded on lines 21 and 22. The total to be accounted for (total of lines 18 through 22) should be recorded on line 23.

The amount of each product dispensed to other departments should be recorded in the proper column of lines 27 through 31. The total taken from storage (total of lines 27 through 31) should be recorded on line 32.

The calculated inventory, the difference between lines 23 and 32, for each product, should be recorded on line 33. The actual inventory taken at the end of the day should be recorded on line 36. Any difference between the calculated inventory, as shown on line 33, and the actual inventory, as shown on line 36 for each column, would be the gain or loss in storage of that particular product. The gain or loss should be recorded on line 38.

As previously indicated, in order to compute a production balance for the day it is necessary to determine the net change in inventory for each product held in storage. The difference between the morning inventory (line 17) and the evening inventory (line 37) is the net change in inventory and should be recorded on line 39.

No space is provided on form 15 to note the other departments involved in intra-plant transfers of products. However, space is provided on the

reports of the other departments to note the quantity received from or placed in storage. Small plants should not experience much difficulty in keeping these records accurately. If difficulty is experienced, the storage department can issue a memorandum on each transfer, thus eliminating any doubt as to source of errors.

In order to keep form 15 as small and convenient to handle as possible, only one unit column is provided for each product. Plant men should record in the units with which they are working (gallons or pounds). If the record is kept in gallons, conversion to pounds can be made by using conversion factors. This should be done in the office, not by plant men.

Packaged Products - Many cooperatives experience sizeable product losses due to the fact that they do not have an effective inventory control on the cooler. These losses are sometimes thefts but not always.

It is not at all unusual for plant men, route men, office personnel and others to go into the cooler and help themselves to a pint of milk or whatever else might meet their fancy. At the same time, these persons would not think of reaching into the plant cash register to take the value of the product.

In some cases plant managers claim they allow such a "help-yourself" policy to exist as a personnel good will measure. The danger of such practices is that they may get beyond control and become very costly.

Some associations check the cash and accounts of route salesmen very thoroughly but do not have a checker at the cooler when the routes load out during the day. Such practices are not consistent. Loss of product is just as effective in reducing returns from the sale of milk as is loss of cash.

Associations should keep a strict control over the finished product cooler. To keep such a control, a record must be kept on all products going into or out of the cooler, including products consumed but not paid for by employees and others.

An inventory record (form 15) is necessary to keep cooler losses at a minimum. However, this record must be supplemented with other records of the movement of products in and out of the cooler, such as the bottling report and route check-out forms. These are discussed in other sections of this report.

An inventory of the cooler should be taken at least once each day. If considerable loss is experienced, two inventories should be taken each day - one before processing operations begin and another after processing is completed for the day.

Form 15 is designed primarily for two inventories a day but can be conveniently used if only one inventory is taken.

Two inventories daily - The evening inventory of the previous day should be recorded in the proper product and unit column of line 1. The form is designed so that associations using both paper and glass containers can record the quantities separately. Any products returned from routes, processed, or purchased after the evening inventory is taken, and prior to the taking of the morning inventory, should be recorded on lines 2 through 5. The total of the evening inventory (line 1) and receipts (lines 2 through 5) should be recorded on line 6. The route load-outs should be totaled and recorded on line 7. Products taken from the cooler, other than the quantity taken on routes, should be recorded on lines 8 through 11. The total of all products taken from the cooler (lines 7 through 11) should be recorded on line 12. The difference between this total (line 12) and the evening inventory plus receipts (line 6) for each product is the calculated inventory and should be recorded on line 13. The actual morning inventory, taken after the initial route load-out, should be recorded on line 16. The difference between the calculated inventory (line 13) less losses due to broken packages while in storage (line 14) and the actual inventory (line 16) is the gain or loss experienced and should be recorded on line 17.

All products received in the cooler after the morning inventory is taken should be recorded on lines 18 through 22. A total of the receipts plus the morning inventory should be recorded on line 23. All products moving out of the cooler should be recorded on lines 24 through 31 and the total of these recorded on line 32. The morning inventory, plus receipts during the day, less the total taken out of the cooler is the calculated inventory and should be recorded on line 33.

The evening inventory should be recorded on line 36. The difference between the total of calculated inventory (line 33) less losses due to broken packages while in storage (line 34), and the actual inventory (line 36) is the gain or loss, and should be recorded on line 37. The gain or loss incurred between the previous evening inventory and the morning inventory (lines 14 and 16) plus the gain or loss incurred between the morning and evening inventories of the day of operations (lines 34 and 37) is the total gain or loss for the 24 hours period and should be recorded on line 38.

One inventory daily - If one inventory daily is sufficient, it should be taken in the evening after all processing operations are completed. Then only lines 1 through 17 of form 15 need be used.

The previous evening inventory should be recorded on line 1. All receipts during the 24-hour period following the inventory should be recorded on lines 2 through 5. All products taken out of the cooler should be recorded on lines 7 through 11.

The previous evening inventory (line 1) plus total receipts (line 6), less the total of products taken out of the cooler (line 12) is the calculated inventory. The heading of line 16 should be changed to P.M. inventory and the actual evening inventory should be recorded on this line. The difference between the calculated and actual inventory is the gain or loss.

In some plants the inventory is taken in the morning, after the routes have been loaded, rather than in the evening. This is done because of the crowded condition of the cooler in the evening. If an excessive gain or loss is found in any one day, it is usually not possible to determine the source of error. It may be due to an error in the bottling report or the route check-out. With proper organization of the cooler, it should be possible to take an inventory in the evening regardless of crowded conditions.

Ice Cream - One inventory of the ice cream hardening and storage room each day should be sufficient in most fluid milk plants because there is much less activity in these rooms than there is in the bottled milk storage rooms.

Form 16 can be used for the inventory control of ice cream. This form is, for the most part, self explanatory. It can be used regardless of the time of day the inventory is taken.

The most important consideration in the inventory control of ice cream products is proper labeling. Unless sufficient care is taken in labeling items placed in the hardening room, the job of inventory control is extremely difficult.

#### PRODUCTION SUMMARY

To determine how much of the product is lost in the entire processing operation, the departmental reports discussed in the previous section must be summarized.

As soon as plant operations are completed for the day, the departmental reports should be sent to the office. To be most useful these reports should be summarized as soon as possible so that the source of any excessive loss may be located. The final summary should be available at least by noon of the day following the operations reported.

The procedure for summarizing the departmental report is:

1. Check all departmental transfers of products to see that they have been properly recorded on the reports of the departments concerned.
2. Complete the incompletely completed portions of the departmental reports, that is convert other units to pounds, calculate fat content, and calculate the gain or loss of the department.
3. Transfer production, utilization and gain and loss data to the production summary (form 17).
4. Total the columns of the production summary to determine the processing gain or loss.
5. To the processing loss, add the returned products which could not be used, loss of products in the cooler, and route losses.

**FORM 16**

FORM 17  
PRODUCTION SUMMARY

Date:

When the reports of the individual departments are turned into the office, the person responsible for summarizing them should first check the record of product transfers between departments. Unless these transfers are recorded correctly, the production summary will not be correct.

The department reports should be completed in the office. In the discussion of the individual department reports it was pointed out that plant men should not be required to calculate the fat content of the various products nor should they be required to compute the conversion of the various units into pounds.

A conversion table such as table 1 can be used to completing these reports.

Table 1. - *Approximate weight per gallon of milk and cream at various temperatures.*

Temperature (°F.)	Skim Milk	Milk (4 per- cent fat)	Cream with a fat content of --				
			20 percent	25 percent	30 percent	35 percent	40 percent
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
40-----	8.660	8.610	8.540	8.500	8.470	8.450	8.420
45-----	8.655	8.605	8.525	8.485	8.450	8.425	8.395
50-----	8.650	8.600	8.510	8.470	8.430	8.400	8.370
55-----	8.645	8.595	8.495	8.450	8.410	8.375	8.345
60-----	8.640	8.590	8.480	8.435	8.390	8.350	8.320
65-----	8.635	8.585	8.460	8.420	8.370	8.330	8.295
70-----	8.630	8.580	8.450	8.400	8.350	8.310	8.270
75-----	8.625	8.570	8.435	8.385	8.330	8.290	8.250
80-----	8.620	8.565	8.420	8.370	8.315	8.270	8.230
85-----	8.610	8.560	8.405	8.355	8.295	8.250	8.210
90-----	8.600	8.550	8.390	8.340	8.280	8.230	8.190
95-----	8.590	8.535	8.380	8.325	8.265	8.215	8.170
100-----	8.580	8.520	8.370	8.310	8.250	8.200	8.150
105-----	8.570	8.510	8.360	8.300	8.240	8.190	8.140
110-----	8.555	8.500	8.350	8.290	8.230	8.175	8.125
115-----	8.542	8.485	8.335	8.280	8.215	8.165	8.110
120-----	8.530	8.475	8.325	8.270	8.205	8.155	8.100
125-----	8.517	8.465	8.315	8.260	8.195	8.145	8.090
130-----	8.505	8.450	8.300	8.250	8.185	8.130	8.075
135-----	8.490	8.440	8.290	8.240	8.170	8.120	8.065
140-----	8.480	8.430	8.280	8.230	8.160	8.110	8.050
145-----	8.470	8.420	8.270	8.220	8.150	8.100	8.045

After completing the department reports, all utilization and production data should be transferred from these reports to the production summary (form 17). The information needed for the summary is indicated on the form. If it is necessary to replace forms 4, 6 and 7 with form 8, the data for which the source is shown on the Production Summary (form 17) as being form 4, 6 or 7, should be taken from form 8.

In reporting cottage cheese production, to compute the production balance, the total ingredients used should be recorded rather than just the weight of curd or creamed cheese produced. If the weight of only the curd and creamed cheese produced is used, in the final analysis the whey will show as a loss. Separate space has been provided to record the weight of the dry or creamed curd.

To compute the processing gain or loss, only pounds and fat content of products used and produced need to be transferred. This summary can be used not only as a work sheet to determine processing loss but also by the management as a complete production summary. For this reason, columns have been provided to record the amount of product in gallons and quarts and the test of the products. These columns can be eliminated if desired.

Form 17 is divided into two sections. All production and utilization data should be recorded in the upper portion of the form. The lower right portion can be used to calculate the processing loss and the lower left portion can be used in calculating the total operating loss.

The difference between the total of the columns headed pounds and fat on the utilization (upper left) side of the form and the corresponding columns on the production (upper right) side of the form is the processing loss.

To determine the total operating loss, all returns that cannot be used, loss of product in the cooler (form 15), and losses on routes or in the sales room must be added to the processing loss.

As pointed out earlier in this report, plants using the drip sample method of determining the butterfat content of total milk received from producers should check the amount of butterfat received as measured by this method with the amount received as measured by testing the samples of milk delivered by individual producers. If any difference is found, it should be deducted from or added to the processing loss for the testing period.

When the department reports and the production summary have been completed they should be made available to both management and plant personnel. This draws attention to the results of efforts to reduce losses, or to careless practices and improperly operating equipment, whichever the case may be.

An elaborate butterfat accounting system involves unnecessary expense unless the information is used. In addition, if plant personnel are not informed of the results of their efforts they will soon lose interest.

### SUGGESTED SALES RECORDS AND PROCEDURES

Sales records are not usually thought of as a part of the product accounting system. However, they are discussed here because they account for physical quantities of products as well as money.

Managers of fluid milk distributing associations should not look upon their sales records merely as records of past sales. Sales are the life blood of fluid milk distributing associations. Continuous effort and planning are necessary to increase sales or even to maintain sales. Good records can and should be used as the basic tool in planning sales programs.

Sales records, by showing what is happening on the individual routes, show which route men need assistance and encouragement. They should also show which products need sales promotion and the areas needing further development.

The accounts receivable balance must be watched very closely. If accounts receivable are uncontrolled, losses may be incurred which will exceed gains from well-planned and aggressive selling. Here again current sales records can be useful. The daily route report should carry the balance outstanding. This balance should be watched closely so that the individual routes can be controlled. If the total route balance appears to be high, the route book should be checked immediately to determine which individual accounts are excessive.

### ROUTE SETTLEMENT REPORT

The basic sales record -- the load or route report -- is very closely related to the product records discussed previously. Product records are not complete unless products taken on routes or charged to the sales room are accounted for. Route men should be held responsible for unexplained shortages.

Many different types of route load and settlement reports are in use. Some associations use a combined load and settlement report such as the one illustrated by form 18, while others prefer separate reports for load and settlement. The combined type has many advantages but cannot be recommended over the separate reports without knowing the accounting procedures of the individual plant.

The main advantage of the combined report is that it is a single source for all sales information and transfer of data from one form to another is held to a minimum.

The load portion of form 18 is designed so that three copies are made. Copies can be retained by the cooler-checker and the routeman in

FORM 18  
DAILY ROUTE SETTLEMENT REPORT

OLD HERE

WHOLESALE COLLECTIONS		RETAIL COLLECTIONS		CASH RECAP		Route	Date		
NAME	AMOUNT	NAME	AMOUNT	CHECKS		REQUISITION	EXTRA OR CUT	2ND LOAD	SPECIAL
				NAME-ACCOUNT	AMOUNT				
TOTAL CHECKS									
CURRENCY									
HALVES									
QUARTERS									
DIMES									
NICKELS									
PENNIES									
TOTAL CHECKS AND CASH									
OFFICE CHARGES									
				ACCOUNT NAME	AMOUNT				
SPECIAL ALLOWANCES									
NAME	AMOUNT								
TOTAL									
OFFICE COLLECTIONS									
				ACCOUNT NAME	AMOUNT				
ROUTE TRANSFERS									
NAME	FROM ROUTE								
TOTAL									
NAME	TO ROUTE								
TOTAL		TOTAL							

addition to the copy turned into the office when the driver checks in. Forms, such as this, can be purchased with the carbon on the form itself, or separate pieces of carbon paper can be used.

Many associations are bottling in both paper and glass containers. For this reason space is provided to record the units and their values separately.

The settlement section of the report should be completed by the routeman prior to checking in. Details of all items -- cash, collections, office collections, office charges, route transfers, and allowances -- should be recorded in the allotted space on the reverse side of the form.

The office routine should be organized so that the necessary personnel are available to verify the route settlement reports when the individual drivers check in each day. By verifying each of these reports as the driver checks in, questions of shortages and overages can be more readily clarified and many grievances avoided.

This form should be perforated and punched so that it will fit modern holding devices (clip-strip or peg board) for the crosswise addition of figures. If this is done, figures can be summarized without transferring them to summary sheets.

In addition to summarizing the unit and value sales figures daily to get total daily sales, the individual route sales should be summarized every 10 or 15 days and also monthly. In this way, the management can get a good picture of the trend of sales by routes and type of product.

Associations preferring to use separate settlement and load reports can use a settlement report such as form 19. This report is practically the same as the settlement portion of form 18.

If form 19 is used, the net load must be taken from the route load and returns report. Automatic register tickets or peg-board strips, such as the load strips of form 18, serve very well as load and return records. The disadvantage of automatic register tickets is that they are unwieldy to handle in calculating the net load.

Retail Accounts - The route book is the main record of retail accounts receivable for fluid milk plants. Many associations encounter difficulty in keeping the total of outstanding accounts as carried in the route book, in agreement with the outstanding balance as carried on the daily settlement report.

Several associations have been able to reduce the seriousness of this problem by using route book sheets on which the routemen record the number and value of the units delivered to each customer and also calculate the outstanding balance for each customer after delivery. See form 20. This type form requires a little more of the driver's time each day. However, the total of the driver's time required in keeping records may be materially reduced. Associations that have adopted the

**FORM 19**  
**DAILY ROUTE SETTLEMENT REPORT**

DATE \_\_\_\_\_ ROUTE NO. \_\_\_\_\_ NAME \_\_\_\_\_

NET LOAD	PRODUCT				RETAIL UNITS	WHOLESALE UNITS	RETAIL VALUE	WHOLESALE VALUE	TOTAL VALUE
P G	Gal.	STO	Gal.	P G					
P G	Qt.	STO	Qt.	P G					
P G	Pt.	STO	Pt.	P G					
P G	$\frac{1}{2}$ Pt.	STO	$\frac{1}{2}$ Pt.	P G					
P G	Qt.	Homo	Qt.	P G					
P G	Pt.	Homo	Pt.	P G					
P G	$\frac{1}{2}$ Pt.	Homo	$\frac{1}{2}$ Pt.	P G					
P G	Qt.	SP	Qt.	P G					
P G	$\frac{1}{2}$ Pt.	SP	$\frac{1}{2}$ Pt.	P G					
P G	Gal.	SK	Gal.	P G					
P G	Qt.	SK	Qt.	P G					
P G	Qt.	Choc	Qt.	P G					
P G	Pt.	Choc	Pt.	P G					
P G	$\frac{1}{2}$ Pt.	Choc	$\frac{1}{2}$ Pt.	P G					
P G	Qt.	BM	Qt.	P G					
P G	$\frac{1}{2}$ Pt.	BM	$\frac{1}{2}$ Pt.	P G					
P G	Qt.	CBM	Qt.	P G					
P G	$\frac{1}{2}$ Pt.	CBM	$\frac{1}{2}$ Pt.	P G					
P G	Qt.	CC	Qt.	P G					
P G	$\frac{1}{2}$ Pt.	CC	$\frac{1}{2}$ Pt.	P G					
P G	Qt.	WC	Qt.	P G					
P G	$\frac{1}{2}$ Pt.	WC	$\frac{1}{2}$ Pt.	P G					
12 OZ.	SC	12 OZ.							
$\frac{1}{2}$ Pt.	SC	$\frac{1}{2}$ Pt.							
Lb.	Pt. Ch.	Lb.							
Lb.	C. Ch.	Lb.							
12 OZ.	C. Ch.	12 OZ.							
Lb.	Butter	Lb.							
$\frac{1}{4}$	Butter	$\frac{1}{4}$							



**FORM 20**  
**ROUTE BOOK PAGE**

Name \_\_\_\_\_ Route No. \_\_\_\_\_  
Address \_\_\_\_\_ Apt. No. \_\_\_\_\_ Salesman \_\_\_\_\_

Page Number \_\_\_\_\_

### Transferred from Route

### Credit rating

Collect on

10

form have found that with fewer errors in outstanding accounts the time required to search for errors has been reduced. Also, much less time is required in calculating the balances of the individual accounts at the end of each month or when collections are scheduled.

However, regardless of the type of route book that is used, unless the daily settlement reports are checked very carefully and the routemen are impressed with the need for accuracy, errors will continue to exist and be troublesome.

Generally, the customs of the market determine the method by which route accounts are collected. In many markets, all collections are made by routemen direct from the route book. In others, monthly statements are made from the route book and sent to customers; in this case the major part of the payments are received at the office.

Office payments sometimes have been encouraged in order to give routemen more time for soliciting new customers. However, this policy has been questioned by some managers because of the loss of the routemen's contact with old customers.

Some associations have found that customer statements have helped in keeping accounts receivable at a minimum even though the major portion of the collections are made by the routemen. Forms 21 and 22 are examples of two types of statements in general use.

To combat the problem of incorrect balances, a few associations have installed bookkeeping equipment and use this equipment to post the route sales, collections, and account balances for the individual retail accounts following each route delivery. This can be readily accomplished with every-other-day delivery. The routemen turn their books into the office after each day's delivery and posting of the individual customer accounts is done the following day. Two copies are made of the posted ledger. At the end of each month a copy of the ledger is sent to the customer as the statement.

The three main claims for this practice are: The number of errors in the retail accounts are reduced, the office has complete route account records should the route book be lost, and the customer likes to receive an itemized statement.

The final evaluation of this machine method of handling retail accounts cannot be made until sufficient operating cost data are available to make possible a cost comparison with the manual method.

Wholesale Accounts - Wholesale accounts are normally handled in the office, rather than by the route men. When delivery is made, the quantities and values are recorded on a sales voucher similar to form 23. At least two copies of this sales voucher should be made, one copy to be retained by the customer when the products are delivered and the other to be turned into the office as a permanent record. Some associations prefer to have two copies of the voucher turned into the

## FORM 21

## RETAIL CUSTOMER STATEMENT

(NAME AND ADDRESS OF ASSOCIATION)

(A SALES MESSAGE)

(CUSTOMER'S NAME  
ADDRESS)

PLEASE TEAR AND RETURN WITH PAYMENT	AMOUNT \$	DATE	FOR PERIOD ENDING	
			Balance Past Due	
			Qts. Standard	
			Pts. Standard	
			Qts. Homogenized	
			Pts. Homogenized	
			Qts. Special	
			Qts. Skim	
			Qts. Chocolate	
			Pts. Chocolate	
			Qts. Buttermilk	
			Qts. Whole Buttermilk	
			Qts. Coffee Cream	
			½ Pts. Coffee Cream	
			Qts. Whip Cream	
			½ Pts. Whip Cream	
			Pkgs. Cr. Cottage Cheese	
			Lbs. P1. Cottage Cheese	
			Lbs. Butter	
			Total	

FORM 22  
RETAIL CUSTOMER STATEMENT  
(NAME AND ADDRESS OF  
ASSOCIATION)

(NAME AND ADDRESS  
OF CUSTOMER)

FOR PERIOD ENDING

**FORM 23**  
**WHOLESALE CUSTOMER STATEMENT**  
(NAME OF ASSOCIATION)

DATE \_\_\_\_\_

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

Rec'd By

No. 21365

office so that one copy can be sent to the customer with the regular statement. In this way, any item on the statement that the customer might question is clarified by the accompanying vouchers. If this procedure is followed, the sales voucher should be made in triplicate.

The machine method of posting wholesale accounts is in general practice. Considering the size of sales to the average wholesale customer, this method is entirely justifiable for associations with a fair volume of wholesale sales.

Credit Policy - Setting time limits on individual accounts, both wholesale and retail, is a generally accepted credit policy with milk distributing cooperatives. This can be done because sales to individual customers do not vary much from one week to another. The manager, or other person responsible, establishes a time limit on each account. The time limit is normally based on the size of average purchase and the credit rating of the individual concerned. Most associations secure the necessary credit information on their accounts from established credit investigating agencies.

#### SUGGESTED PRODUCER PAYROLL RECORDS AND PROCEDURES

The producer payroll, like sales records, ordinarily is not considered as a part of the product accounting system. However, like sales records, the producer payroll accounts for products handled in the plant, as well as other items. Therefore, a discussion of it appears to be a pertinent part of this report.

Methods of determining the amount of milk and butterfat received each day were discussed in the preceding section which dealt with receiving room records. Unless the milk received from individual producers is sampled and tested each day, the exact amount of butterfat to be accounted for during a producer pay period is not known until the producer payroll is completed.

Before work on the producer pay roll can proceed, the following information is needed: 1. The total amount and average test of the milk received from each producer; 2. the price to be paid for milk and the butterfat differential; and 3. the amounts to be deducted from the payments to individual producers for supplies and such items as dairy products purchased, hauling, capital retains, and advance payments.

Various types of forms that can be used in recording the weight of milk received from individual producers have been discussed (forms 1, 2 and 3).

Most associations rely on either periodic fresh samples or composite samples for the purpose of determining the butterfat test of the total milk received from individual producers each pay period. The results of the tests of these samples should be turned over to the office with the record of the weight of milk received from the individual producers.

A "suspense file" should be kept on all producer purchases. When individual producers purchase products or supplies, the sale should be recorded on a voucher such as form 24. Copies of these should then be filed until needed for the producer payroll.

Hauling charges and capital retains are usually set on a per hundred-weight basis. These rates usually do not vary enough from one pay period to another to present much of a problem in keeping records.

When all the necessary information is available, the amount due individual producers can be calculated on a producer settlement journal such as form 25, or a multiple copy writing board system with records, such as forms 26, 27 and 28, can be used.<sup>3</sup>

The writing board system has the advantage of eliminating the necessity of transferring information from one form to another. The producer's statement (upper detachable portion of check), the individual producer ledger, and the payroll journal and check register are all completed at the same time. This not only reduces the time required in completing the producer pay roll, but also eliminates errors which often are made in transferring figures from one form to another. Several firms specializing in office systems and methods handle writing board payroll systems. Further information can be obtained from local office equipment and supply stores.

If form 25 is used, when all calculations are completed, a statement such as form 29 or 30 should be completed for each producer and a check issued for the amount due.

The information on the payroll journal should also be transferred to individual producer ledgers. A form such as form 27, can be used. These ledgers will then provide the association with a complete record of the patronage of each producer member.

#### PAY ROLL PROOF

The time available to complete the producer pay roll is usually very limited and errors in calculations are rather frequent due to this fact. To be sure that all errors are eliminated before producer statements and checks are distributed, a proof of the payroll should be made. One type of proof is illustrated below:

- (1) 
$$\frac{\text{total fat received}}{\text{total pounds of milk received}} = \text{ (average test of all milk)}$$
- (2) 
$$3.5 + \text{ or } - \text{ (average test)} = \text{ (difference in test)} \times \text{ (butterfat differential)}$$
  

$$= \text{ (deduction from or addition to the 3.5 price)}$$

<sup>3</sup>All of these forms have been prepared to include information acquired for operation of a base-surplus seasonal pricing plan. Many associations have adopted that plan.

FORM 24  
PRODUCERS PURCHASES STATEMENT  
(ASSOCIATION NAME  
ADDRESS)

DATE \_\_\_\_\_

Sold to \_\_\_\_\_

Shipping No. \_\_\_\_\_

Sold By

Received By

PRODUCERS SETTLEMENT JOURNAL  
FORM 25

## For Period Beginning \_\_\_\_\_ And Ending \_\_\_\_\_

(NAME AND ADDRESS OF ASSOCIATION)

## PRODUCER PAY ROLL RECORDS

**FORM 28**

**FORM 27**

(NAME AND ADDRESS OF ASSOCIATION)

ND. 35653

PRINTED	(NAME OF ASSOCIATION)		
MESSAGE	(ADDRESS)		
TO	ND. 35653		
PAY TO THE ORDER OF:	\$ _____		
TO	DOLLARS _____		
PRODUCERS	PRODUCER PAYROLL ACCOUNT (NAME OF ASSOCIATION)		
(NAME AND ADDRESS OF BANK)			

FORM 29  
PRODUCERS SETTLEMENT STATEMENT

(NAME OF ASSOCIATION)

(PRODUCER'S NAME AND NUMBER)

Milk Statement

Month of \_\_\_\_\_

Daily Shipments	1	8	15	22	29	Lbs. Shipped	Per Cwt.	
	2	9	16	23	30	Lbs. Base	@	
	3	10	17	24	31	Lbs. Surplus	@	
	4	11	18	25			Total Value	
	5	12	19	26		Hauling		
	6	13	20	27		Dairy Supplies		
	7	14	21	28		Capital Retain		
	Totals					Dairy Products		
							Net Check No.	

FORM 30  
(NAME OF ASSOCIATION)  
PRODUCERS SETTLEMENT STATEMENT

Month of \_\_\_\_\_

(PRODUCER'S NAME AND NUMBER)

Test \_\_\_\_\_

Price Per Cwt. for Base Milk	\$ _____
Price Per Cwt. for Surplus Milk	\$ _____
Total pounds at \$	\$ _____
Total pounds at \$	\$ _____
Gross value of all milk	\$ _____
Hauling	\$ _____
Dairy supplies	\$ _____
Dairy products	\$ _____
	\$ _____
	\$ _____
	\$ _____
	\$ _____
Hauling	Rate per Cwt.
Capital retain	\$ _____
	\$ _____
	\$ _____
TOTAL DEDUCTIONS	\$ _____
Net Check No.	\$ _____

(3) (3.5 price) + or - (deduction from or addition to the 3.5 price) = (average price)

(4) (average price)X (Total pounds of milk received) = (payroll proof total)

If the butterfat test on which all producer payments are based is other than 3.5 percent, the basic test used should replace the 3.5 in the above calculations.

Both the average test and the average price should be calculated to at least the fifth or sixth decimal point. If this is done, there should be not over 4 or 5 cents difference between the proof total and the total value of milk as shown on the payroll. If more than this difference exists, undoubtedly an error has been made in either the payroll or the proof.

If a two price system such as the base and surplus plan is used, the above calculations must be made for the quantities of milk paid for at each price.

